

# Web services and RESTful services

Julia Rackerseder  
*Bioinformatics Lab 2013*

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# OUTLINE

## WEB SERVICE

- What is a web service?

- Communication between two machines

- Service Description

- SOAP

## REST STYLE WEB SERVICE AND WSDL 2.0

- What is REST?

- REST constraints

- Using REST with WSDL

- Freecontact WSDL

# WHAT IS A WEB SERVICE?

Definition by W3C: [6]

*A **Web service** is a software system designed to support interoperable machine-to-machine interaction over a network. It has an interface described in a machine-processable format (specifically WSDL). Other systems interact with the Web service in a manner prescribed by its description using SOAP messages, typically conveyed using HTTP with an XML serialization in conjunction with other Web-related standards.*

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???

# WHAT IS A WEB SERVICE?

Easier definition:[4]

*Web services are XML-based information exchange systems that use the Internet for direct application-to-application interaction. These systems can include programs, objects, messages, or documents.*

# COMMUNICATION BETWEEN TWO MACHINES

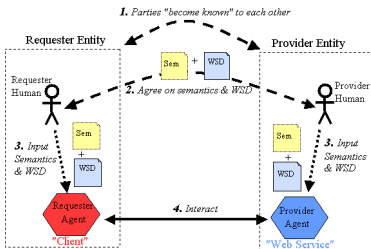


Figure: [5]

*A **Web service** is a software system designed to support interoperable machine-to-machine interaction over a network.*

- ▶ method for two devices to communicate
- ▶ located at a network address
- ▶ software function
- ▶ always reachable

# COMMUNICATION BETWEEN TWO MACHINES



Figure: [5]

- ▶ Abstract idea of Web service is implemented by an agent
- ▶ Program in any language
- ▶ Web service (provider agent) and Web service client (requester agent) communicate

# SERVICE DESCRIPTION

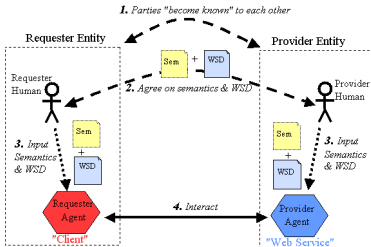


Figure: [5]

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## SERVICE DESCRIPTION

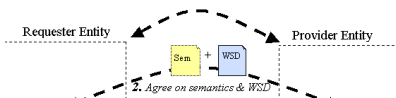


Figure: [5]

- ▶ WSD (web service description) documents the mechanics of the message exchange
- ▶ WSDL is based on XML, therefore independent of language and protocol
- ▶ specifies the interface
- ▶ both entities have to agree on semantics and WSD
- ▶ behaviour of web service

# SOAP

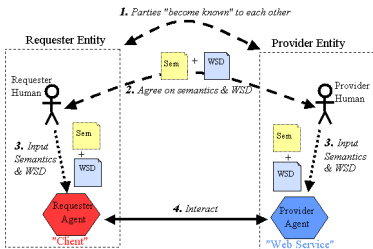


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# SOAP

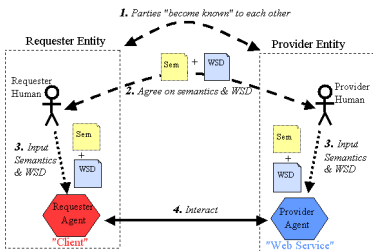


Figure: [5]

- ▶ SOAP(Simple Object Access Protocol): protocol for accessing a Web Service
- ▶ ... is a format for sending messages (XML, independant of language and protocol)
- ▶ applications can exchange information over HTTP or any other protocol (e.g. FTP)
- ▶ But: now (WSD 2.0 it is possible to use HTTP and HTTPs without encoding the message into SOAP

# WHAT IS REST?

- ▶ Representational State Transfer
- ▶ Not a standard protocol, but programming paradigm for web applications or distributed systems (e.g. www)
- ▶ The “lightweight” alternative to Web services
- ▶ Idea: rather than using complex mechanisms (e.g. SOAP) to connect between machines, use simple HTTP
- ▶ Resource-centric vs action-centric.



# USING REST WITH WSDL

- ▶ CRUD acces methods not divided into parts, like in XML
- ▶ Direct use of PUT, GET, POST, DELETE

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Minimal elements needed for WSDL 2.0:

```
<wsdl:description  
  xmlns:wsdl="http://www.w3.org/ns/wsdl">  
  <wsdl:types/>  
  <wsdl:interface/>  
  <wsdl:binding/>  
  <wsdl:service/>  
</wsdl:description>
```

[3]

# FREECONTACT WSDL

Explain `freecontact_rest.wsdl`:

`http://rostlab.org/~lkajan/freecontact\_rest.wsdl`



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